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AUTHOR Joseph, Helen
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ABSTRACT

This plan for a 3-week unit on computer literacy is designed to acquaint students with the computer, what it is, what it can and cannot do, its impact on society, and career opportunities. The students learn to use the computer through interaction with a canned program, and write a short program using the BASIC language. The plan indicates what to do each day, including use of audiovisual materials, topics for discussion, and worksheets for students. Appendices include directions for the teacher before teaching the unit, a guide for student aides, operating instructions for the PET microcomputer, a glossary of terms, and a list of resource materials.

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ED216898

LESSON PLAN

FOR

COMPUTER LITERACY UNIT (3 WEEKS)

GRADES 7-9

U.S. DEPARTMENT OF EDUCATION
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GOAL: Acquaint students with the computer, what it is, what it can and cannot do, its impact on society and career opportunities.

OBJECTIVES:

1) Learn to use the computer through interaction with a canned program.
2) Write a short program using the BASIC language including using the computer as a calculator to solve arithmetic problems.

EVALUATION:

1) Written program
2) Test

SCHEDULE:

Week 1: Instruction in the classroom.
Week 2: Students on line with canned programs, rotating basis.
Week 3) Students on line RUNning their programs, rotating basis.

CONTACT:

Helen Joseph, Resource Teacher
Novato Unified School District
1015 Seventh Street
Novato, CA 94947
(415) 897-4255

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INTRODUCTION

A need exists for computer related materials for use in the classroom. Junior High School teachers who have taken a class in BASIC often ask, "Now that I know something about computers how do I include this information in my classes, how much should I teach, and how do I schedule it with my regular class work?" This unit has been designed to meet these needs by providing a detailed structured guide with a time line and ready-made materials to support teachers who are introducing computers to students for the first time.

This material will work with a limited number of computers. Most teachers start out with one to three machines. By rotating this unit through a department that teaches a required course for a grade level, such as math, science or English, the entire school population becomes computer literate. This has the added benefit of involving several teachers and broadening computer awareness of the faculty.

Use of this unit will represent a first step into the world of computers. Because of technological breakthroughs, computing power is within the economic reach of everyone. Experts in the field predict this technology will have as great an impact on society as did the industrial revolution. Where the industrial revolution relieved the drudgery of man's physical labor, the computer revolution will relieve the drudgery of man's intellectual labor.

We can only speculate on the direction this revolution will take us. However, looking back over the past 200 years, two things can safely be concluded: (1) We can expect dramatic changes in the way we work, play and relate to others, and (2) We will need to understand and be able to use the new technology to participate fully and comfortably in the changing world.

An analogy on the importance of understanding computers can be found in the automobile. Following is a quote from an article in the January-February, 1980, Recreational Computing Magazine, titled "Beating Computer Anxiety" by Thornburg and Burr:

> "Cars have been around for a long time, and yet there are still people who have 'car anxiety' and don't drive. If these people live in a community without public transportation, this can be a real nuisance. In the computer-rich society of late twentieth century America, computer anxiety will be both a nuisance and a danger . . . . . All people must become sufficiently computer literate to understand and to participate in determining the role of computers in our society . . . . an urgent need for the majority of people to understand that a computer is just another machine which can be used to assist man in his work, a machine which can be totally controlled by each and every one of us. That understanding is what we are trying to achieve."

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LESSON PLAN

WEEK 1
DAY 1

WEEK 1

Present information on computers in general and the PET in particular.

DAY 1

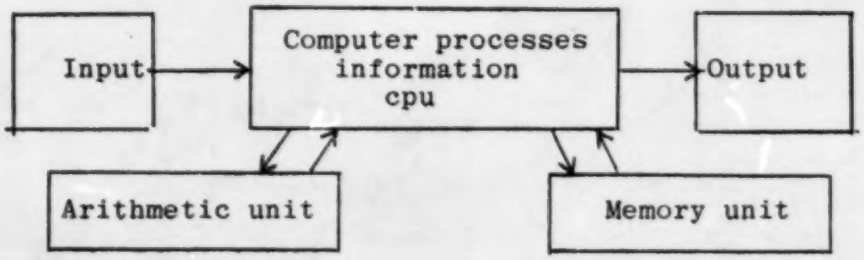
(A) Show the film strip, "Computers Can't Think", see page 27, Section C (or substitute other AV material).

(B) Pass out Glossary and remind students to take notes as they are responsible for definitions of words introduced.

(C) Topics for discussion after film strip:

1. The PET operates on the same principle as the large computer in the film. Display the following model either on an overhead projector or the blackboard.

A schematic model of a computer:



A computer has three parts:

a) The central processing unit or cpu is the control unit. Think of it as "the boss". It makes the decisions about where information is to go and what is to be done with it.

b) The memory unit stores information until it is needed.

c) The arithmetic unit performs additions and subtractions and makes comparisons.

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2. The computer in the film strip is a large computer, an I.B.M. machine. Some parts of the computer are contained in different units. The unit that contains the cpu and arithmetic unit is called the main frame.

3. Some units shown in the film are called peripherals and are attached to and controlled by the computer. These are card readers, disc drives, magnetic tape readers, printers and terminals.

4. A large system such as this costs hundreds of thousands of dollars and is used by large corporations, banks and government agencies. Large computers often have nation-wide networks involving thousands of peripherals and the ability to exchange information with other computer systems.

5. The middle sized computer, or mini-computer, has less capacity. Mini-computers cost about $10,000 to $50,000 and are used by large businesses, schools, libraries, local governments, etc. The computer terminals at Lawrence Hall of Science are interfaced with a mini-computer.

6. There are two main kinds of large computers:

   a) Batch computer: This type of computer can do only one job at a time. A job is fed in, the computer works on that one job until it is finished, then stops. Punched cards are used on batch computers.

   b) Time sharing computer: Several people use this type of computer at the same time. Think of this operation as being similar to MacDonalds. They don't take one order, cook it, and then deliver it to the customer before taking another order. Instead, they serve many people at the same time. This is the way a time sharing computer works. The computer is so fast it can serve many users at different terminals at what seems like the same time, but everyone is actually taking turns. The computer terminals at the Lawrence Hall of Science are time sharing.

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7. Due to a technological breakthrough in the early '70's, the ability to make a cpu on a small chip smaller than your fingernail, revolutionized the computer industry. This new technology led to the development of the micro-computer. In a span of 2 or 3 years the price of a computer dropped to under $2,000. It is now possible to purchase a complete computer for $500 to $800 and prices will probably drop even more in the future. Today's micro-computers are more powerful than the large computer. ENIAC, built in 1946.

8. Popular micro-computers currently on the market are PET by Commodore, TRS-80 by Radio Shack, the Apple II by Apple Corporation, TI-99/4 by Texas Instrument, Atari 400 and 800 and others. It is possible to interface peripherals such as a printer or disc system to these micro-computers.

9. All three sizes of computers - the large, the mini and the micro - perform essentially the same job. The differences are in the capacity of the cpu, the size of the memory, and the speed of operation. The larger machines process more information faster and therefore need larger memories.

10. The capacity of a machine is often measured in terms of its memory space or bytes. You can think of a byte as a character such as a "B" or a "2" or a space. A large computer's capacity is measured in terms of mega-bytes or millions of bytes. A micro is measured in thousands of bytes. The PET is a 8K micro-computer, which means it can handle 8 thousand bytes. The K stands for a factor of 1000.

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(D) Emphasize the meaning of key words. A suggested guide follows:

Define:

1. batch computer: does one job at a time.
2. time sharing: many users use the same computer at the same time.
3. peripheral device: printer, disc, terminal, etc. interfaced with and controlled by computer.
4. interface: a connector.
5. main frame: the unit that contains the cpu on a large computer.
6. TRS-80: micro-computer distributed by Radio Shack.
7. user: the person using the computer.
8. byte: unit of memory measure. Can be thought of as equivalent to one character symbol.
9. cpu: central processor unit is decision making part of computer.

Contrast and compare:

10. input and output:

    Input is information fed into the computer. Output is information received back from the computer.

11. terminal and computer:

    A terminal is a peripheral device for input or output of information only. A computer contains a cpu and can be programmed to do a job.

12. large, mini and micro-computer:

    The larger the computer, the more it costs, the greater capacity cpu, the larger memory and the faster operating speed.

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WEEK 1
DAY 2

DAY 2

A The following three pages contain information about computers in society. Each paragraph is followed by a question to stimulate thought. Below are some suggested uses of this material. ADJUST THE MATERIAL TO THE ABILITY OF YOUR STUDENTS.

1. Read a paragraph or use overhead projector and discuss each question with class as you come to it.
2. Lecture on the material with discussion session at end.
3. Ditto material and have students write responses to turn in or to use in small discussion groups.

KEY The questions on the following pages are open ended and, therefore, have no correct answers. However, listed below are a few possible responses.

1. Computerized homes, schools, transportation systems, shopping, entertainment, robots, all aspects of business and manufacturing.
2. Report cards, class schedules, bills, taxes, the library, entertainment, transportation, communications, etc.
3. Grinding flour from wheat, processing other foods, making cloth, shoes, tools, any manufactured item, harvesting crops, etc.
4. Answers will vary.
5. Could represent large illegal profits to a store and a fraud against the public.
6. By being knowledgeable, informed and supporting government representatives that protect the public's interest.
7. The losses are passed on to the consumer in the form of higher costs or smaller profits, depending on the transaction.
8. Be flexible and have an open mind to learning new skills as needed. Develop problem solving skills.
9. Answers will vary.

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Name_____

Date_____Period____

Computer Literacy Unit
COMPUTERS IN SOCIETY

Please read the following and answer the questions:

1. The new technology that developed the micro-computer is rapidly entering all our lives. Adam Osborne, a pioneer in the field, predicts the computer will have as great an effect on our lives as the invention of the automobile did on previous generations.

   QUESTION: Suggest some ways your life may be different in the future because of computers.

2. Even now, our lives are touched by computers daily. Computers are used to process schedules, report cards and tests in schools. Computers are used by the government, hospitals, banks and most businesses. It is difficult to name a business that isn't connected with computers in some way.

   QUESTION: Name all the ways you can think of in which computers affect your life.

3. Because the development of the computer has come so fast, many people in the United States have little knowledge about them and what they can and cannot do. A computer is a machine. It is neither smart nor stupid. It is a machine that can be programmed to perform routine tasks formerly done by humans, only faster and more accurately. Because of this, some people have come to fear computers. They confuse this ability to perform jobs previously done by humans with "intelligence". The science fiction image of a computer as "intelligent" has also helped create this myth that computers can think.

   QUESTION: Name some jobs now done by machines that were formerly done by people.

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4. Some businesses have added to the confusion. Whenever a bank or a business tells a customer, "the computer made a mistake.", the customer is being misinformed. Computers break down, but they don't make mistakes! The people operating or programming the computer make the errors!

   QUESTION: Have you or anyone in your family ever been given the excuse, "The computer made a mistake."? If so, explain.

5. In California on May 1, 1979, the retailers and grocery chain business lobbyists killed a bill that would require grocery stores to print prices, other than zebra codes, on individual items. This means that when a customer is served by the automated checkout, there will be no way to determine if an overcharge has occured. It is true that the computer won't make errors, which is the argument used by the grocers, but people who set the prices in the computer can make errors,accidentally or otherwise.

   QUESTION: Do you think a penny or two overcharge on the part of a store really makes very much difference? Explain your answer.

6. Computers are not going to take over the world. However, persons interested in gaining power and control may try to use computers this way. An educated public is our best protection from this danger.

   QUESTION: How can people protect themselves from those who would misuse the computer?

7. Computer crime is a big problem in this country and the world. On an average, there is a computer theft committed every 60 minutes. Because the machine is impersonal, programs written to embezzle accounts or banks seem victimless, which, of course, is not true. There are some laws and regulations already on the books and more

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are being written, but computer theft is a new crime and difficult to detect.

QUESTION: Who do you think pays for losses to banks and large businesses who have been victimized?

8. Another fear is that computers are going to put people out of work. It is true that computers are doing routine jobs formerly done by humans. However, at today's rate, for every job eliminated by the machine, five are created. People will need to retrain for new jobs, perhaps as many as 2 or 3 times during their working years. It is projected that 80% of the products we will use in our daily lives in the year 2000 have not yet been invented. Perhaps this is overstated, but there are many changes ahead in jobs and products.

QUESTION: What can you do now to help prepare yourself for a changing world?

9. There will be many jobs created in the future. This is true now in the computer industry. At present there are 5 times more jobs available than there are qualified people to fill them. Salaries are high, and positions are open for women as well as men.

QUESTION: Does anyone in your family use a computer on his/her job? If yes, please explain what the use is.

10. The computer is a fantastic invention which has given us the capability to do dull, routine jobs quickly and accurately. It is a tool to serve human beings, not the other way around.

QUESTION: Has your attitude toward computers changed? What is your attitude toward computers?

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DAY 3

A Define a program. (use glossary as needed)

1. A program is a series of instructions for a computer to follow. A computer is neither smart nor stupid. It is a machine that can be programmed to write a message, solve a math problem, play a game or do many other jobs.

2. A program must be written in a code or language the computer understands. Different computers use different languages and some languages are better suited to do specific jobs.

   a) FORTRAN is used in scientific and engineering fields.

   b) COBOL is used in banking and business.

   c) BASIC is used in education and on most micro-computers. BASIC is an acronym for "Beginners All-purpose Symbolic Instruction Code". It is always written in capitol letters.

B Write a program in BASIC.

1. When a user sits down at a computer, it may be in the middle of doing something. You can tell if PET is busy by checking the lowest message on the screen. If it says "Ready" with a blinking white square underneath, you may begin. This is the Ready message and means PET is ready for your input. The blinking white square is the cursor. You will learn more about the use of the Ready message and the cursor next week when you are on line.

2. After you get the Ready message, type (input) the following into the computer. After each line, press the return key (hereinafter abbreviated <r>).

```
NEW                                          <r>
10 REM JOE SMITH, 1ST PROGRAM                <r>
20 PRINT "I AM GREAT"                        <r>
30 END                                       <r>
```


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3. After the above program has been entered, the computer will just sit there patiently. What you have done is give a series of statements which are stored in the computer's memory. Statements have line numbers. The computer doesn't do anything after it receives a statement.

4. NEW is a command. NEW tells the computer to erase the memory. Commands do not have line numbers. The computer needs a command to execute the above program.

Input:

```
RUN                                                    <r>
```

Output:

```
I AM GREAT
```

(C) Write another short program.

1. Here is an example of a program to write with students. If a message is over 40 characters in length, continue it on the next line with a new line number.

Input:

```
NEW                                                    <r>
10 REM THE CLASS GRADE AND NAME                        <r>
20 PRINT "CLASS MESSAGE"                               <r>
30 PRINT "AND"                                         <r>
40 PRINT "ANOTHER SHORT MESSAGE"                       <r>
50 END                                                 <r>
RUN                                                    <r>
```

2. Trace the RUN (Output):

```
CLASS MESSAGE
AND
ANOTHER SHORT MESSAGE
```

(D) Debug a program.

1. Input:

```
NEW                                                    <r>
10 REM NAME, 2nd PROGRAM                               <r>
20 PRINT "YOUR SCHOOL ISSS GREAT"                      <r>
30 END                                                 <r>
RUN                                                    <r>
```


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2. Trace the RUN. Acknowledge the error in line 20. Errors in a program are called bugs and correcting errors in a program is called debugging a program. To debug this program, retype line 20 correctly.

```
20 PRINT "YOUR SCHOOL IS GREAT"                    <r>
```

The computer will automatically replace the old statement with the corrected one.

(E) LIST a program

1. The previous program is stored in the computer's memory. To check its accuracy display the contents of the memory on the screen with the command LIST.

```
LIST                                               <r>
10 REM NAME, 2ND PROGRAM
20 PRINT "YOUR SCHOOL NAME IS GREAT"
30 END
```

Notice line 10, the REMarks statement, shows in the LIST but would not show in the RUN.

(F) Insert lines into an existing program.

1. Input:

```
NEW                                                <r>
10 REM NAME, 3RD PROGRAM                           <r>
20 PRINT "TWO MORE DAYS UNTIL FRIDAY"              <r>
30 END                                             <r>
```

2. You decide to change this program. You want to insert line 15 and then skip a line. Line 16 is a dummy PRINT statement and it skips a line.

```
15 PRINT "TODAY IS WEDNESDAY"                      <r>
16 PRINT                                           <r>
```

3. The computer always stores lines in numerical sequence no matter what order they are entered.

```
LIST                                               <r>
10 REM NAME, 3RD PROGRAM
15 PRINT "TODAY IS WEDNESDAY
16 PRINT
20 PRINT "TWO MORE DAYS UNTIL FRIDAY"
30 END
RUN                                                <r>
TODAY IS WEDNESDAY
                                    { notice line 16 caused
                                      the computer to skip
TWO MORE DAYS UNTIL FRIDAY            a line here.
```

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(G) More practice with LIST and RUN.

1. Display the following program on the overhead projector or the blackboard and together with students LIST and RUN.

```
NEW                                                    <r>
10 PRINT "ROSES ARE RED"                               <r>
40 PRINT "BUT DUMBER THAN YOU"                         <r>
20 PRINT "VIOLETS ARE BLUE"                            <r>
30 PRINT "COMPUTERS ARE FASTER"                        <r>
15 PRINT                                               <r>
25 PRINT                                               <r>
50 END                                                 <r>
35 PRINT                                               <r>
5  REM NAME, 4TH PROGRAM                               <r>
8  REM PRACTICE PROGRAM TO LIST AND RUN                <r>
40 PRINT "BUT CAN'T THINK LIKE YOU!"                   <r>
LIST                                                   <r>
5  REM NAME, 4th PROGRAM
8  REM PRACTICE PROGRAM TO LIST AND RUN
10 PRINT "ROSES ARE RED"
15 PRINT
20 PRINT "VIOLETS ARE BLUE"
25 PRINT
30 PRINT "COMPUTERS ARE FASTER"
35 PRINT
40 PRINT "BUT CAN'T THINK LIKE YOU!"
50 END
RUN                                                    <r>
ROSES ARE RED

VIOLETS ARE BLUE

COMPUTERS ARE FASTER

BUT CAN'T THINK LIKE YOU!"
```

(H) Class assignment.

1. Ditto page 14, Basic Worksheet I. The key is below.

KEY 1. RUN
THERE WAS A YOUNG LADY NAMED BRIGHT
WHO TRAVELED MUCH FASTER THAN LIGHT
SHE STARTED ONE DAY
IN A RELATIVE WAY
AND RETURNED ON THE PREVIOUS NIGHT

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2. LIST <r>

```
10 REM TEST 2
20 PRINT "THIS PROGRAM HAS SOME BUGS"
30 PRINT "AND"
40 PRINT "I AM GOING TO CORRECT THEM."
50 END
```


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Name_____

Date_____Period____

Computer Literacy Unit
BASIC WORKSHEET I

1. Please trace a RUN of the following program.
(Hint: every mark has meaning, so read carefully!)

```
NEW                                                    <r>
10 REM TEST 1                                          <r>
20 PRINT "THERE WAS A YOUNG LADY NAMED BRIGHT"<r>
30 PRINT "SHE STARTED ONE DAY"                         <r>
40 PRINT "AND RETURNED ON THE PREVIOUS NIGHT" <r>
50 END                                                 <r>
35 PRINT "IN A RELATIVE WAY"                           <r>
25 PRINT "WHO TRAVELED MUCH FASTER THAN LIGHT"<r>
RUN                                                    <r>
```

2. Please debug this program and LIST it correctly.

```
10 REM TEST 2                                          <r>
20 "THIS PROGRAM HAS SOME BUGS                         <r>
30 PRINT AND                                           <r>
40 "I AM GOING TO CORRECT THEM".                       <r>
50 END                                                 <r>
LIST                                                   <r>
```


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(A) Define terms.

1. The terms 'hardware' and 'software' are used with computers. Hardware is the physical machine that you can see and touch. Software is language, the programs, the part of the machine that is not tangible.

2. The programs we wrote yesterday are software. Today we'll develop software to do some calculations. Following is a list of the math operators used in BASIC:

Arithmetic symbol:		means:	
	+		add
	-		subtract
	*		multiply
	/		divide
	( )		parentheses
	↑		exponent

(B) Order of operations (optional).

1. If this is the first introduction to order of operations, there is a drill on page 19 that is skill level 7 average.

2. The computer follows order of operations. The following phrase helps students remember the order from left to right by checking the order of first letters in the saying.

Please Excuse My Dear Aunt Sally.

1)	P	parentheses
2)	E	exponents
3)	M and D	multiply and divide in order from left to right.
4)	A and S	add and subtract in order from left to right.

(C) Use the computer as a calculator in direct mode.

1. If you wish to use the PET as a calculator, a line number is not necessary. This is called direct mode. The user does not have to type NEW to do this. Using direct mode does not disturb the program in memory.

Input:

```
PRINT 56/7                                    <r>
```

Output:

```
8
```


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2. Do several examples with the class using different operators. Emphasize that direct mode does not use line numbers. Note that the computer carries division to 9 decimal places. It prints numbers equal to or greater than a billion in a form of scientific notation.

```
PRINT 23 + 35                                    <r>
58
PRINT 18 - (4 * 3)                               <r>
6
PRINT 6.08/7                                     <r>
.868571429
PRINT 2 * 1000 000 000                           <r>
2E + 09
```

(D) Use the computer to solve a computation within a program.

1. Using the PRINT statement twice, it is possible to print the math problem and its answer. Remember, this is a program and must have line numbers.

```
NEW                                              <r>
10 REM JOE SMITH, MATH PROBLEM                   <r>
20 PRINT "56/7="                                 <r>
30 PRINT 56/7                                    <r>
RUN                                              <r>
56/7=
8
```

(E) Disable the linefeed with the semi-colon.

1. To have 56/7=8 print on the same line, retype line 20 with a semi-colon at the end. The semi-colon disables the linefeed while the computer executes the next line in the program.

```
20 PRINT "56/7=";                                <r>
RUN                                              <r>
56/7=8
```

2. Do another example of semi-colon use. To separate the two words, a space must be left after the I or before the T.

```
NEW                                              <r>
10 PRINT "HI";                                   <r>
20 PRINT " THERE"                                <r>
RUN                                              <r>
HI THERE
```


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3. This is another example of semi-colon use.

```
NEW                                          <r>
10 PRINT "8 * 6 + 2 =";                      <r>
20 PRINT 8 * 6 + 2                           <r>
RUN                                          <r>
8 * 6 + 2 = 50
```

(F) Class assignment

1. Ditto and give students the BASIC Worksheet II on the following page or, if you wish, display the problem on the overhead projector or the blackboard. The key is below.
(Note the computer uses decimal names, not fractions. For low ability classes, remind students the decimal name of 4½ is 4.5)

KEY Trace of RUN (output)

```
IF THERE WERE 999 ELEPHANTS IN CAPTAIN
KANGAROO'S GARDEN AND THEY EACH ATE
4-1/2 BALES OF HAY A DAY, HOW MANY BALES
OF HAY WOULD THEY EAT IN TWO DAYS?

2*999*4.5=8991 BALES OF HAY



AN ELEPHANT, FROM TRUNK TO TAIL,
MEASURES 5 METERS.  WHAT IS THE
MEASURE IN CENTIMETERS?

5 * 100 = 500 CENTIMETERS
```


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LESSON PLAN
Day 4 Continued

Name _____

Date_____Period _____

Computer Literacy Unit
BASIC WORKSHEET II

Please trace a RUN of the following programs:

```
10 REM ELEPHANT MATH PROBLEM                                    <r>
20 PRINT "IF THERE WERE 999 ELEPHANTS IN CAPTAIN"               <r>
30 PRINT "KANGAROO'S GARDEN AND THEY EACH ATE"                  <r>
40 PRINT "4-1/2 BALES OF HAY A DAY, HOW MANY BALES"             <r>
50 PRINT "OF HAY WOULD THEY EAT IN TWO DAYS?"                   <r>
60 PRINT                                                        <r>
70 PRINT "2*999*4.5=";                                          <r>
80 PRINT 2*999*4.5;                                             <r>
90 PRINT "BALES OF HAY"                                         <r>
100 END                                                         <r>
RUN
```

```
10 REM METRIC CONVERSION                                        < r >
20 PRINT "AN ELEPHANT, FROM TRUNK TO TAIL,"                     < r >
30 PRINT "MEASURES 5 METERS.  WHAT IS THE"                      < r >
40 PRINT "MEASURE IN CENTIMETERS?"                              < r >
50 PRINT                                                        < r >
60 PRINT "5 * 100 =";                                           < r >
70 PRINT 5 * 100;                                               < r >
80 PRINT "CENTIMETERS"                                          < r >
90 END                                                          < r >
```


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Name_____

Date_____Period_____

Computer Literacy Unit
ORDER OF OPERATIONS WORKSHEET

1. 2*4+5=
2. 9-8/2=
3. 4*4-10=
4. 12+6/3
5. 16/2-5=
6. 6-10/5=
7. 4*5*3=
8. 24/2*4=
9. 7-2+4=
10. 9+6-3=
11. 25-15/5=
12. 7+4*3=
13. 2*3+5*2=
14. 6*2-4/2=
15. 3+5+2*6/2=

KEY

1) 13
2) 5
3) 6
4) 14
5) 3
6) 4
7) 60
8) 48
9) 9
10) 12
11) 22
12) 19
13) 16
14) 10
15) 14

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(A) Class assignment.

1. Each student is to write an original program in BASIC. Suggestions for the assignment follow. Option (a) is better if time is available.

   a) Write a word problem similar to the one on BASIC Worksheet II. A RUN of the program would print and solve the problem. SEE FOOTNOTE BELOW*

   b) Write two short messages, such as "My birthday is May 8th" or "The 49ers are great", and write a math expression. A RUN of the program would print the messages, the expression and solve the expression.

2. The program is to be turned in for corrections and a grade. It is to be returned to the student during the third week of the unit to enter in the computer, to LIST and to RUN (see WEEK 3).

KEY Every program will be a little different, however two samples are listed below in an acceptable form.

a)
```
NEW                                                          <r>
10 REM STUDENT'S NAME                                        <r>
20 PRINT "IF 5 POUNDS OF POTATOES COST $1.20,"               <r>
30 PRINT "WHAT DOES 1 POUND OF POTATOES COST?"               <r>
40 PRINT                                                     <r>
50 PRINT "$1.20/5=$";                                        <r>
60 PRINT 1.20/5                                              <r>
70 END                                                       <r>
```

optional statement

will not round off without special instructions omitted here.

b)
```
NEW
10 REM STUDENT'S NAME                                        <r>
20 PRINT "I LIKE FRIED CHICKEN"                              <r>
30 PRINT "AND APPLE PIE."                                    <r>
40 PRINT                                                     <r>
50 PRINT "23.059*675=";                                      <r>
60 PRINT 23.059*675                                          <r>
70 END                                                       <r>
```

* Some students get very involved in this and write long, wordy problems that take a long time to enter in computer, given students' hunt-and-peck typing skills. Decide whether to limit programs to a certain number of lines (not to exceed 39 characters each) depending on your time and machine constraints.

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The most common student errors are: forgetting to type NEW; forgetting to type a REM statement; misspelling words; forgetting to type PRINT in a PRINT statement; forgetting the quotation marks when needed or putting them in when not needed; putting in an equal sign when a solution to a computation is desired (this will give an error message); putting in too many or too few semi-colons; solving for the answer to the math problem rather than setting it up in a BASIC expression for the computer to solve.

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WEEK 2

The students take turns on line using canned programs.

(A) Notify the students that they will have a chance to use the PET one day during the week.

1. If you have not already done so, divide the class into computer groups of 2 or 3 students.

2. Assign a day and a time to each group, allowing an extra session toward end of week for absentees. If possible allow a full class period for each group.

3. Because students are in and out of the room all week, regular class assignments are impossible. A suggestion is to give a week long assignment consisting of four days of class work plus the one day on the computer without specifying which day.

(B) Alert the computer aides to be prepared for student groups this week.

1. Although the aides are already trained, be sure they have a copy of their Guide (APPENDIX B).

2. Tell aides what programs you wish students to use. Limit the number to 3 at most (if there is too much choice, students spend all their time LOADing programs). HANGMAN is one game that works well. The first game or program should be very interesting but not very complicated. The objective is to teach students machine familiarity.

3. A suggestion to head off problems before they begin. On the first day of the week, introduce the computer aides to the class and tell the class in the presence of the aides what procedure is to be followed in the computer room: the aides will teach the students how to turn PET on, to LOAD and use a program, to Break and get the Ready message, to LIST and to RUN. Students are to take turns typing. (You may wish to say something about expected behavior, too.)

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WEEK 3

WEEK 3

Students take turns on line to enter, RUN and LIST their programs.

A Notify the students that sometime during the week they will enter their program in the computer, LIST and RUN it.

1. Return each student's corrected and graded program (written the first week) as his/her turn comes. Suggest sending two students at the start. When the first returns to class, send the next one. In this way each student observes the procedure once and performs it once.

B Alert the computer aides that students will be entering their programs this week.

1. Review the procedure for WEEK 3 with aides as outlined in their guide (APPENDIX B).

C Inform the students on the procedure for using the computers outside of class time (before school, lunch, after school) and mention some of the available game programs.

D Student evaluation

The exercise on the following page was originally designed as a test, but it is too difficult for most classes after such a brief unit.

Because the purpose of this unit is to introduce computer technology as a tool, which people/students can use and control, to remove anxiety and encourage students to take more computing classes, a negative test experience at this time would be detrimental. I suggest NO test on this unit but evaluation based on the student's written program.

Assign the following exercise as a final worksheet. Allow students to RUN the program on the last page if machines are available.

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KEY

1.	G	11.	C	21.	F
2.	F	12.	B	22.	T
3.	J	13.	A	23.	F
4.	E	14.	D	24.	F
5.	B	15.	C		
6.	D	16.	C		
7.	A	17.	A		
8.	I	18.	D		
9.	C	19.	D		
10.	L	20.	C		

25. IF AN EGG WEIGHS 4 OUNCES
AND HALF AN EGG,
WHAT DOES AN EGG AND A HALF WEIGH?

THE SOLUTION IS 4+4+4=12 Ounces

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Name_____

Date_____Period_____

Computer Literacy Unit
FINAL WORKSHEET

Choose the letter in column 2 that goes with the number in column one.

_____1.	Computer language	A.	The keyboard
_____2.	Software	B.	RUN
_____3.	CRT	C.	REM
_____4.	Clear memory	D.	END
_____5.	Executes the program in memory	E.	NEW
_____6.	Last line in program	F.	Computer program
_____7.	Hardware	G.	BASIC
_____8.	Displays program stored in memory	H.	Cursor
_____9.	Remarks that accompany a program	I.	LIST
____10.	Person interacting with computer	J.	Video screen
		K.	Skips a line
		L.	User

Choose the letter of the phrase that correctly completes the statement:

_____11. Commodore PET is a
- A. species of cat
- B. mini-computer
- C. micro-computer
- D. terminal

_____12. Computers are
- A. very intelligent
- B. machines that can be programmed to follow instructions.
- C. very dumb
- D. semi-human

_____13. The flashing white box on the PET screen is the
- A. cursor
- B. CRT
- C. cpu
- D. byte

3-3-82

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_____14. Using the computer as a calculator without line numbers is called
A. off line
B. debugging
C. on line
D. direct mode

_____15. Instructions given the computer to do something such as NEW, LIST and RUN are called
A. peripherals
B. statements
C. commands
D. users

_____16. The decision making part of the computer is called
A. the arthmetic unit
B. the thinking unit
C. the central processor unit
D. the disc drive

_____17. The size of a machine is often in terms of its memory capacity measured in
A. bytes
B. bits
C. RAMs
D. binary numbers

_____18. Information can be input to a computer by
A. punched cards
B. a keyboard
C. magnetic tape
D. all of the above

_____19. A large computer such as IBM main frame has many peripherals such as
A. terminals
B. printers
C. card readers
D. all of the above

_____20. Correcting a program that contains errors is called
A. demagnetizing
B. processing
C. debugging
D. tracing

Answer true or false:

_____21. Computer crime is not expensive to the public because it is usually directed at large corporations or banks.

_____22. The computer industry is creating more jobs than it is eliminating.

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True or false (Cont)

_____23. If you receive an erroneous bill printed by a computer, you can blame the computer because it made the mistake.

_____24. After the user has typed a command or a statement and wants the computer to respond, they should press the RUN/STOP key.

25. Trace a RUN exactly as it would print on the screen:

```
NEW                                                          <r>
10 REM THE EGG AND A HALF PROBLEM                            <r>
20 PRINT "IF AN EGG WEIGHS 4 OUNCES"                         <r>
25 PRINT "AND HALF AN EGG,"                                  <r>
30 PRINT "WHAT DOES AN EGG AND A HALF WEIGH?"                <r>
40 PRINT                                                     <r>
50 PRINT "THE SOLUTION IS 4+4+4=";                           <r>
60 PRINT 4+4+4;                                              <r>
70 PRINT " OUNCES."                                          <r>
80 END                                                       <r>
RUN                                                          <r>
```


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APPENDIX A

TEACHER'S GUIDE

There is some preparation necessary before teaching this unit.

(A) Teacher preparation.

1. Hands on experience with a PET and a short introduction in BASIC programming will be necessary. Short courses to fill these needs are offered by Lawrence Hall of Science and the Marin Computer Center (see Additional Resources section in Appendix E).

2. Read through the unit. Look up terms in the glossary as needed. Do all the tasks that will be required of the students.

(B) Student Aides to assist the teacher.

1. Student Aides play a major roll in this unit. During the second and third weeks of the unit, students using the computers will need assistance that will be difficult if not impossible for the teacher to supply. Student Aides can fill this need. Training of aides and their duties are outlined in Student Aide's Guide, Appendix B. If possible, choose aides who are strong in math, interested in computers, seldom absent, patient and not "know-it-alls". One difficulty with student aides is that they get impatient and take over decision making and/or the typing.

(C) Materials needed for unit.

1. The filmstrip, "Computers Can't Think" which is Part A of Eye Gate kit, "Living With Computers", X207 (see Audio Visual section in Appendix E or check with your local IMC for this or similar material). This is needed Week 1, Day 1.
2. Filmstrip projector and cassette player for Week 1, Day 1.
3. A class set of glossaries. Reproduce Appendix D.

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4. Student worksheets, tests, etc. reproduced for the first week (see Lesson Plan).

5. Canned game programs for second week. HANGMAN is recommended.

(D) Student Involvement.

1. A few days before it begins, inform students about the 3 week Computer Literacy Unit.

2. Have students prepare to take notes as there is no textbook.

3. Divide the class into computer groups of two or three students. Self selection works well. Each group will have one game playing session on the computer during the second week.

(E) Miscellaneous suggestions.

1. Have printed instructions with the PET at all times. You may reproduce Pet Operating Instructions, Appendix C.

2. Encourage use of the glossaries. It is a great expectation to have students learn computer jargon in one week!

3. At the end of Week 1, Day 2, you will know which students have family members who work with computers. Perhaps you could involve some of them in a computer career day. An excellent resource for computer related careers is the Occupational Outlook Handbook, 1978-79 Edition, Computer and Related Occupations, U.S. Department of Labor Bulletin 1955.

4. If the class is small enough and a PET is available Week 1, Days 3 and 4, it would be helpful to use it to demonstrate the BASIC statements and commands as they are taught.

5. This unit is designed for average to high ability students and needs revision for low ability students. They require more time than allowed here and have difficulty with the attention to detail needed in programming. Use class assignment 1(b), page 20 or help them write their program. Simplify the final test.

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APPENDIX B

STUDENT AIDE'S GUIDE

Student aides must be knowledgeable about the operation of the PET.

A Training for student aides.

1. To assist students on the PET, AIDES need to be proficient at the following. How to:

   a) turn PET on and off

   b) LOAD a program.

   c) Use all the canned game programs chosen by the teacher.

   d) Break a program with RUN/STOP key and get Ready message.

   e) RUN a program

   f) LIST a program.

   g) clear computer memory with NEW.

   h) correct typing errors with delete key and/or by retyping the line.

   i) use cursor controls on upper right side of number pad and shift INST/DEL key.

   j) solve minor problems students have using PET. If all else fails, turn PET off and start over.

2. In addition to the above, aides should work through the Lesson Plan, pages 9-21, to become familiar with BASIC and have an understanding of the programs students will be entering during the third week.

3. The student aide's role in this unit is to assist the students when help is needed, not to do their work for them. Use good common sense.

4. Before the unit begins, the teacher and the aides should agree on behavior standards and aides' responsibility.

B Duties of student aides.

1. Follow any special instructions from the teacher.

2. Be responsible for helping the students and caring for the equipment.

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3. Introduce the PET to each group using the following procedure. Have students take turns typing.

   a) Show where the PET OPERATING INSTRUCTIONS are posted and demonstrate turning PET off and on.

   b) Show the group an important capability of computers that is more fun to learn on line. Have a student input:

```
NEW                                          <r>
10 PRINT "STUDENT'S NAME"                    <r>
RUN                                          <r>
```

   Have another student input:

```
15 GO TO 10                                  <r>
RUN                                          <r>
```

   Tell students this is a loop and it, used with other statements, is how a computer repeats a process. Have a student press the RUN/STOP key and input:

```
10 PRINT "ANOTHER STUDENT'S NAME";           <r>
RUN                                          <r>
```

   Have a student press RUN/STOP key and input line 10 again leaving a space between the E and last " or, another way to make the change, you may demonstrate use of cursor controls and shift INST/DEL key to insert the space.

```
10 PRINT "ANOTHER STUDENT'S NAME ";          <r>
RUN                                          <r>
```

   Press RUN/STOP. Allow students to experiment with this for a few minutes.

   c) Show the students how to LOAD the game program.

   d) Let them play one round of the game and show them how to break the program with the RUN/STOP key.

   e) Show them how to LIST the program.

   f) Show them that they can begin the game again from the beginning by typing RUN and return.

   g) Let the students play the game until the end of the session.

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4. During the final week of the unit have students input their handwritten programs. Two students will be with you at the beginning of the session. Have one input his/her program while the other watches. After the program is entered, have the student follow the checklist below.

   a) LIST the program.

   b) debug with aide's assistance.

   c) LIST

   d) RUN

   Congratulations are due the student who has written a computer program correctly.

   Collect the handwritten program and note the student's performance on it. Send the student back to class immediately with instructions to send the next one. Meanwhile, have the waiting student input his/her program.

   Repeat the above process until the end of the session.

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APPENDIX C

PET OPERATING INSTRUCTIONS

1. Be sure PET is plugged in.
2. Turn on switch (left rear). Do not touch round fuse!
3. Message on screen should be:
   *** COMMODORE BASIC ***
   7167 BYTES FREE
   READY

HOW TO LOAD A PROGRAM:

1. Place cassette in holder, close lid.
2. Press REW on cassette.
3. When tape drive stops, press STOP.
4. On keyboard, press together: [RUN STOP] [SHIFT]

   until message reads: LOAD
   PRESS PLAY ON TAPE #1
5. Press PLAY on cassette.
6. Screen message is: SEARCHING
7. Wait 20 seconds. Message on screen should be: FOUND "Program"
   LOADING

   If not, repeat process from #2 above.
8. It takes about 3 minutes to LOAD and then you will be in program. When program is loaded, press STOP on cassette, then REW, then STOP again. You may remove cassette as program is now in PET's memory.

If you have a problem making a program run or if you wish to begin the program again, press <return> , then press the RUN/STOP Key until READY message appears. Then type word RUN and press <return>.

Note: The RUN/STOP and SHIFT keys pressed together give 2 alternating messages. Keep pressing the two keys until the message you want appears. You will get either:
READY
or
LOAD
PRESS PLAY ON TAPE #1

If you wish to try another program follow instructions above on HOW TO LOAD A PROGRAM. New program will replace old one in PET's memory.

If you wish to write a program in BASIC, get READY message, (see note above) and type NEW <return> ; then write your program.

If you wish to save a program, get READY message (see note above) and type: SAVE "PROGRAM NAME" <return> and follow instructions on screen. It takes about 3 minutes to SAVE a program. (Use your own tape!)

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APPENDIX D

GLOSSARY

algorithm	A process so well defined a machine can follow it.
Apple	A brand of micro-computer
arithmetic unit	The part of the computer that performs the individual logical and arithmetic operations. The other parts are the cpu and memory unit.
BASIC	The computer language or code used by PET and most micro-computers, an acronym for "Beginner's All-purpose Symbolic Instruction Code".
batch	A batch computer does one job at a time. When it is finished, another job is fed in and so on.
binary number	A number whose only possible digits are 0 and 1. Information is stored in computer's memory in the form of the presence or absence of a magnetic area or electric charge. These "on", "off" charges are thought of as binary numbers and computer languages are a coding of these numbers.
Break	The Break message on the PET means you are out of a program and will list the line number where the exit took place. To RUN the program again, type RUN <r> . To Break, press the RUN/STOP and SHIFT keys together.
bug	An error in a computer program
byte	A unit of memory measure. Can be thought of as one character, either an alphabetic or numeric symbol.
canned program	An existing recorded program ready for use. Usually of general interest.
cathode ray tube	Also known as the CRT, it is the video display unit and looks like a TV screen.
central processor unit	Known as the cpu, it is the decision-making part of the computer. The other parts are the arithmetic and memory units.
COBOL	Computer language used most often in business, an acronym for "Common Business Oriented Language".
Command	Tells the computer to do something, perform the task at hand. Commands are RUN, LIST, NEW, LOAD, etc. and do not have line numbers. Commands are always followed by <r> .

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Commodore	Commodore Business Machines, the brand name of PET.
computer	A machine that can be programmed to follow instructions; it contains a cpu, a memory and arithmetic unit.
cpu	See central processor unit
CRT	See cathode ray tube
cursor	On PET, the little white blinking box that shows where on the screen the computer is pointing or watching. New input always begins at the cursor unless in a program.
debugging	Correcting errors in a program.
delete	Delete means to erase. To delete one character, press the uppermost key on the right side of keyboard. To delete a whole line, get Ready message, then type the line number and press return key.
direct mode	Using the computer for executing one line statements or calculations without using line numbers. It does not change program in memory.
disc system	A peripheral that stores programs and data off line that the computer can access when needed. It is faster than tape.
dummy PRINT statement	Skips a line.
END	The last statement in a program.
error message	PET gives user a message that some statement or command is not understood in existing form. Syntax error is most frequent and means a statement is misspelled or incorrect in format.
FORTRAN	Computer language used in engineering and scientific fields, an acronym for "Formula Translator".
hardware	The physical part of the computer and peripherals you can see and touch such as screen, keyboard, etc.
IBM	International Business Machines, one of the oldest and largest of the computer companies in the world.
input	Information put into a computer.
input device	The equipment or method used for input, such as keyboard, punched card, magnetic tape (cassettes).
interface	A connector between two things. The interface between the computer and the printer allows them to connect and work together.
I/O	An abbreviation for input/output device.

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language	A computer language is a code understood by a computer. Different computers use different languages. Some of these are BASIC, FORTRAN and COBOL.
large computer	Largest of the 3 types of computers. Costs generally exceed $100,000. Greatest cpu capacity, memory and operating speed.
LHS	Lawrence Hall of Science. See Resource Materials List.
library	Computer library contains canned programs for general use.
linefeed	The computer moves the output to the next line automatically. The linefeed can be disabled with the use of the semi-colon (;).
line numbers	In a program, statements have line numbers. The computer executes the statements in sequence beginning with the smallest number. Line numbers are always whole numbers.
LIST	A command that lists or displays the program in memory on the screen.
LOAD	The command that puts a new program into memory, replacing the one that was there. (See operating instructions for method.)
magnetic tape	A tape used to store computer programs. A cassette tape is small magnetic tape.
main frame	On a large computer, the hardware that contains the computer, the cpu and the arithmetic unit and memory.
mega-byte	A million bytes. Memory measurement for large computers.
memory	The part of the computer or peripheral that stores information until needed. The other parts of a computer are the cpu and arithmetic unit.
micro-computer	The smallest computer on the market. The cost is between $500 and $2,000. It has smaller capacity cpu, less memory and is slower than other computers.
mini-computer	The middle sized computer. Sells for $10,000 to $50,000. Has considerably greater capacity cpu, memory and operating speed than the micro-computer.
NEW	A BASIC command that clears the computer's memory.

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off line	Term used when working with computer programs away from the computer.
on line	Term used when working with computer programs on the computer.
output	Information given off by the computer.
output device	The equipment used for output such as CRT, punched cards, hardcopy (paper), etc.
peripheral	A device interfaced with a computer and controlled by the computer such as a printer, terminal, disc system, etc.
PET	The name of the micro-computer manufactured by Commodore.
PRINT	A BASIC statement that instructs the computer to print what follows it in quotes. If a calculation follows the PRINT, the computer will print the result.
program	A series of instructions written in a language the computer understands. When you type RUN, the computer will do the steps in the program in numerical order.
punched card	A card with punched holes in a code the computer can read and understand.
quote marks	Part of a BASIC statement. In a PRINT statement, the message to be printed must be enclosed in quote marks (").
REM	A BASIC statement, short for remarks, that allows the user to name and add explanations to a program that will be carried with the LIST but will not affect the RUN.
Ready message	Message from computer to user that it is ready for either a command or a statement. See "Note" on PET Operating Instructions, Appendix C.
return <r>	The key to press when it is the computer's turn to respond, either after a command, entering a line or interacting with a canned program.
RUN	A BASIC command that instructs the computer to execute the program in memory.
SAVE	A BASIC command that allows the user to put a program resident in memory on tape. See instruction manual for method.
semi-colon	A BASIC statement that disables linefeed.
software	The programs and language that go into the computer.

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statement	A BASIC statement is preceded by a line number. It is an instruction for the computer to follow. The computer stores statements in memory until given a command, such as RUN, LIST or NEW. More statements can always be added to existing statements to make longer programs, up to 7167 bytes.
syntax error	see error message
terminal	A remote peripheral device for I/O, both or either.
time sharing	On larger systems, the ability to I/O from many terminals at the same time, each terminal RUNning a different program if desired. (LHS uses time share.)
Trace	Following the RUN of a program off line.
TRS-80	The Radio Shack's micro-computer, sometimes called 'Tandy'.
user	The person interacting with the computer, either writing or RUNning a program.
zebra code	The pricing code placed on most products sold in grocery and variety stores that can be read by computers. It gets it's name from the varying thickness and spacing between lines that make up the code.

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APPENDIX E

RESOURCE MATERIALS LIST

Revised Spring 1982

This anotated list is in sections. It contains information on books, magazines, newsletters, audio visual aids and additional resources. The asterick (*) denotes books suggested for initial purchase. Many of these books are available at Stacy's Bookstore in San Francisco.

Albrecht, Bob - BASIC FOR HOME COMPUTERS. 1978

This classic self-teaching guide in BASIC has a math orientation. It is not restricted to any one brand of micro. Includes objectives and self tests. An excellent book for beginners in computer eductation. Junior high and up.

John Wiley & Sons, Inc. $7.95

Alexander, Carole - FEED ME, I'M YOUR PET COMPUTER and LOOKING GOOD WITH YOUR PET. 1979

Workbooks designed to be used with a PET computer by beginning students at upper elementary level.

Cow Bay Computing $4.95
P.O. Box 515
Manhasset, New York 11030

Ahl, David - BASIC COMPUTER GAMES.

Complete listings of 101 computer games.
Creative Computing $7.95
Morristown, New Jersey 07960

Ball, Marion J. - WHAT IS A COMPUTER?

A short witty illustrated introduction to computer history, uses and flow-charting. Grades 7 - 8

Houghton-Mifflin $4.35

Billings, Karen - ARE YOU COMPUTER LITERATE? 1981

Can be use for individual instruction. Covers capabilities, applications and implications of computers. Does not require computer equipment. Junior high.

Dilithium Press $5.95

Bitter, Gary G. - EXPLORING WITH COMPUTERS. 1981

Looks at world of computers - their history, how they work, their uses and misuses - some career information.

Messner $7.59
Simon Schuster

* Donahue, Carroll S. - PET/CBM PERSONAL COMPUTER GUIDE, 2ND EDITION.

The most complete resource book on PET/CBM computers.
Osborne/McGraw Hill $15.00
Berkeley, California

Dwyer, Thomas A., - A BIT OF BASIC. 1981

A short light introduction to BASIC based on the author's BASIC AND THE PERSONAL COMPUTER. Numerous illustrations, programs, examples and tips are included.

Addison Wesley Publishing Company $5.95

Fitting, Marjorie A. - TRAINING YOUR COMPUTER (PET EDITION). 1979

Beginning workbook developed at San Jose State University. Upper elementary, junior high.

METRA Instruments, Inc. $4.00
Pickering Division
2056 Bering Dr.
San Jose, California 95131

Lien, David - THE BASIC HANDBOOK.

Encyclopedia of BASIC computer languages. Aid in translating between different dialects.

Stacy's Bookstore $19.95
San Francisco, California

Moody, Robert - THE FIRST BOOK OF MICROCOMPUTERS.

General information about computers, how they work, how they are used, some history and a brief introduction to BASIC. Junior high.

Hayden Book Company $4.95

* Moursund, David - PRECOLLEGE COMPUTER LITERACY: A PERSONAL COMPUTING APPROACH. 1981

One definition of computer literacy for teachers and curriculum planners.

ICCE
Department of Computer and Information Science $1.50
University of Oregon
Eugene, Oregon 97403

Nevison, John M. - THE LITTLE BOOK OF BASIC STYLE.

This book addresses the problem of writing programs that not only solve problems but are also readable and easy to maintain. Recommended to all BASIC programers.

Addison Wesley Publishing Co. $5.95

Osborne, Adam - AN INTRODUCTION TO MICROCOMPUTERS, VOLUME 0 - THE BEGINNER'S BOOK, 3RD ED.

A technical introduction to microcomputers for motivated students and adults.

Osborne/McGraw Hill $7.95
Berkeley, California

Peckham, Herbert - HANDS ON BASIC WITH A PET.

A self teaching guide to BASIC on a PET.

McGraw Hill Book Company $10.95

Slesnick, Twila - TEACHING BASIC BIT BY BIT.

For students ten years old to adult. Includes 8 one and one-half hour lessons. Written for Apple but adaptable to PET

MCEP/Lawrence Hall of Science
University of California
Berkeley, California 94720

Spencer, Donald D. - SIXTY CHALLENGING PROBLEMS WITH BASIC SOLUTIONS. 1977

Problems are mathematical and challenging.

Hayden Book Company $6.95

* Zamora, Ramon - PET BASIC: TRAINING YOUR PET COMPUTER. 1981

An excellent self-teaching guide to BASIC on PET. Junior high and up.

Prentice Hall $14.95

MAGAZINES AND NEWSLETTERS

Because the computer industry is growing so fast and changes occur so often, some of the best and newest information is available in magazines and newsletters.

CLASSROOM COMPUTER NEWS
P.O. Box 266
Cambridge, MA 02138
$12 for 6 issues/year

COMPUTE
P.O. Box 5406
Greensboro, NC 27403
$20 for 12 issues/year

CREATIVE COMPUTING
P.O. Box 789-M
Morristown, NJ 07690
$15 for 12 issues/year

CUE NEWSLETTER
(Computer Using Educators)
% Don McKell
Independence High School
1776 Education Park Drive
San Jose, CA 95133
$6 dues includes 6 issues/year

ELECTRONIC LEARNING
902 Sylvan Ave.
Englewood Cliffs, NJ 07632
$17 for 6 issues/year

THE COMPUTING TEACHER
Department of Computer and Information Science
University of Oregon
Eugene, OR 97403
$14.50 for 9 issues/year

A U D I O V I S U A L

LIVING WITH COMPUTERS X207

Six film strips with cassettes dealing with computers, what they are, what they can and cannot do. The first one, COMPUTERS CAN'T THINK is a nice introduction to this unit. It describles a large IBM system and makes the point that people control computers, not the reverse. This film strip kit is available in the Novato Unified School District through the library system.

Eye Gate House $82.50
Jamacia, New York 11435

COMPUTERS: PEBBLES TO PROGRAMS

Kit contains 3 filmstrips with sound, printed script and brief biographies of 32 persons who contributed to the development of computers. Presentations are well done and information is good. This kit is available on California State Department of Education Instructional Materials List.

Guidance Associates $99.81

ADDITIONAL RESOURCES

Lawrence Hall of Science
Computer Education Project
University of California
Berkeley, California 94720
415 642-3167

The Hall provides a complete service to educators interested in computing for the classroom on PETs, Apples or Ataris. Courses are offered at the Hall or can be provided at a school site. Field trips can be arranged. For more information call Twila Slesnick.

Marin Computer Center
50 El Camino Drive
Corte Madera, California 94925
415 924-1955

This is a public access computer facility with Apples, Ataris and some PETs. Classes are offered for teachers, students and community members. Field trips are encouraged. For more information call Mary Cron.